Intra-Industry Information Releases: Analysing Profit Warnings in the South African Market

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Abstract

This paper examines whether intra-industry information transfers occur as a result of firm profit warning announcements, in the South African market. Profit warnings are announcements made by public companies in advance of their earnings announcements, indicating that profits will fall short of previously expected levels. Profit warnings are part of managers' voluntary disclosures. An information transfer is the process whereby information conveyed to the market about one firm (the announcing firm) conveys value-relevant information about other non-announcing firms, and is usually confined to firms in the same industry. The full sample of profit warnings was divided into those conveying firm specific information and those conveying industry-wide information, so as to enable analysis of each sub-sample. In addition, a cross-sectional regression analysis is performed on each sub-sample in order to establish the significance of various proposed factors affecting the returns of non-announcing firms. The key finding is that profit warning announcements conveying industry-wide information do result in significant intra-industry information transfers in the South African market. Whilst profit warning announcements conveying firm specific information appeared to be characterised by a market hesitant to react hastily, thus resulting in a drop in returns post announcement. Modest intra-industry information transference was observed in the firm specific sub-sample. Finally, the cumulative abnormal returns of the announcing firms, the homogeneity of an industry and recent market sentiment were found to be significant in explaining the movements in the cumulative abnormal returns of the non-announcing firms.

Key words: Intra-industry information; Profit warnings; Firm announcements; Information transfers.

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I Introduction

On an annual or semi-annual basis, listed firms release their financial reports to the public, detailing the earnings of the firm over the last year or half year. Such reports are required to be disclosed by legislation in South Africa, so as to ensure that current shareholders are privy to pertinent information required to make informed decisions. Profit warnings are announcements made by public companies in advance of their earnings announcements, indicating that profits will fall short of previously expected levels. Profit warnings are part of managers' voluntary disclosures. An annual or semi-annual financial report is therefore not a profit warning. This paper is concerned with whether intra-industry information transfers occur as a result of firm profit warning announcements. An information transfer is the process whereby information conveyed to the market about one firm (the announcing firm) conveys value-relevant information about other non-announcing firms, and is usually confined to firms in the same industry (Ball, 2001). The question to be asked then is: Do profit warnings convey industry-wide information in South Africa? This paper attempts to provide an answer by analysing the returns of announcing and non-announcing firms in relation to the returns that would be expected in that industry prior to the profit warning.

Many studies have examined the effects of other forms of disclosures on the prices of securities[1]. Defeo (1986) examined the markets reaction to earnings announcements, Fama, Fisher, Jensen and Roll (1969) studied stock split announcements, announcements of common stock and securities convertible into common stock were examined by Szewczyk (1992) and bankruptcy announcements were researched by Lang and Stulz (1992). There is very little research focused on profit warnings, perhaps because warnings were seldom issued until the late 1990s. This paper focuses on profit *warnings*, not actual earnings announcement or forecasts earnings.

Collett (2004) looked at the unexpected trading volume for the eleven day period beginning five days before the profit warning and ending five days after the profit warning. He found that trading volume, and share price reactions, peaked on the day of the announcement and the day after. The other nine days were not found to show

[1] "Price movements reflect changes in the market's consensus expectations generated by a news announcement" (Collett, 2004).

statistically significant changes in the share price, suggesting that announcements are genuine surprises and that investors are able to assimilate new information quickly. In his study, examination of pre- and post-announcement cumulative abnormal returns (CAR) showed no pre-announcement market anticipation of the announcements. Jackson & Madura's (2003) research of profit warnings disagrees with the findings of Collett. They claim that the signal conveyed in a profit warning is uncertain because the market may have anticipated the information from other news disseminated about a firm, an industry, or the general economy. They show that prices begin to adjust about five days before a profit warning, and the market response is not complete until about five days after the warning. The accumulated response over the 11-day period ending five days after the announcement is −21.7%[2]. They found that there is some evidence of information leakage before profit warnings, highlighted by the -2.38% abnormal share price response on average over the four days prior to the announcement. In addition, Jackson & Madura (2003) advise that investors must determine what a profit warning implies about cash flows beyond the quarter of immediate concern.

Collett (2004) found in a study examining the pre- and post-announcement (CAR), that there is a positive abnormal return on the day after the announcement of negative trading news for the small company sub-sample, suggesting an initial over-reaction to the announcement. This appears to contradict Jackson & Madura's (2003) findings who argue that profit warning announcements elicit a strong negative market response that is "not sensitive to timing the warning in advance of the earnings announcement". Their research found that there is no evidence of a reversal after the period subsequent to the announcement suggesting that the immediate downward revaluation of share prices does not indicate a market over-reaction[3]. In addition, Collet (2004) found that with serial announcers, the second profit warning leads to a greater market reaction and, when companies have to make two consecutive negative statements in a six-month period, the average abnormal returns are more than -30%. Similar results were

[2] The profit warning effect over the two-day announcement period is 32 times the valuation effect upon subsequent releases of the actual earnings.

[3] They also inferred that an under-reaction to a profit warning is usually followed by a period of additional decline in the value of the firms share price.

found in research conducted by Han, Wild & Ramesh (1989) for announcements of earnings reports.

Clinch & Sinclair (1987) assert that research delineating the economics of information asymmetry "provides insights into the dynamics of intra-industry interactions". Their research suggests that information transfers appear to be directional, meaning that an announcement that results in a positive (negative) change in the share price of the announcing firm, results in a positive (negative) change in the share price of other firms in the same industry. The results support Foster's (1981) conclusion that intra-industry information transfers[4] are associated with earnings releases and that they are, on average, directional. Helbok & Walker (2003) conducted similar research on profit warnings issued by UK companies where, much like South Africa, the economic and political environment is less litigious than the United States. They found that 50% of their sample of profit warnings contained quantitative information that resulted in significant intra-industry information transfers that were found to be directional.

The direction of share price movements is thought to depend on the presence of two market forces, namely, the contagion and competitive effects. These market forces have been studied so as to assess the net impact of an announcement by a single firm. Lang & Stulz (1992) explain these two distinct concepts. "The contagion effect is epitomised when a pessimistic announcement released by a specific firm has a negative effect on the share prices of competing firms in the same industry". This may occur due the fact that pessimistic announcements reveal negative information about the components of cash flows that are common to all firms in the industry and, consequently decreases the market's expectation of the profitability of the industry's firms. "The competitive effect occurs when a pessimistic announcement increases the value of the non-announcing firms in the same industry" (Lang & Stulz, 1992). This is thought to occur because of the redistribution of wealth that occurs due to the announcing firm, possibly becoming less efficient.

Szewczyk (1992) argues for a dominant contagion effect, suggesting that investors may infer the general prospects of an entire industry from an announcement as

[4] For Australian industrial securities in the 1977-1981 time period.

opposed to shifts in competitive advantage between competitors. In industries reporting more than one profit warning in a short time interval, Clinch & Sinclair (1987) found that the initial profit warning already conveys the majority of value relevant information about the industry as a whole (contagion effect), resulting in diminishing marginal profit warning effects. Lang & Stulz (1992) found contradictory results from their research, reporting that the competitive effect is dominant in industries where leverage and the degree of competition[5] are low. Kohers (1999) concurs and indicated from his endeavours, the view that the level of competition in an industry is an important factor in explaining industry abnormal returns, as it increases the power of the competitive effect.

Foster (1981) examined the effects of intra-industry information transfers resulting from earnings announcements. He delineates that the earnings of firms are affected by economics factors, industry factors and firm specific factors. Considering industry factors; analysts specializing in specific industries identify key variables that affect movements in industry profitability. Therefore the earnings announcements of one firm in an industry, represents a potential source of information about the impact of movements in these industry-wide variables. Analysts are able to identify movements in these key variables and form opinions about the industry-wide impact they may have. He found that in general, it was observed that a two-day 'abnormal return' for the non-announcing firms was observed. However, these abnormal returns were found to be much less than those observed for the earnings announcing firms. Han, Wild & Ramesh (1989) found that there are increased movements in returns for other firms in the same industry as announcing firms[6]. This appears to suggest the existence of significant industry-wide information conveyed in the earnings announcements of a single firm.

Firth (1976) argues that investors have been using information (other than annual reports) to help predict financial performance prior to the publication of annual reports. Ball & Brown (1968) concur and state that of all the information about an individual firm which becomes available during a year, only 50% is captured in that

[5] Represented by the Herfindahl index.
[6] However, the movements were found to be unrelated in magnitude or direction to the announcing firms return movements.

year's reported earnings figure. In addition, they found that of all the information contained in reported income, no more than about 10% to 15% had not been anticipated by the month of the report. Defeo (1986) agrees, asserting that interim reports are timelier than annual reports and can convey some of the information contained in the annual reports. Instead, Firth (1976) believes that amongst the major sources of data are: "profit warnings and utilising the financial results of closely competing firms to help forecast the forthcoming results of a company". He found that investors used the information obtained from competing firms to revaluate the appropriate share price of a particular firm. The adjustment of share prices was found to be almost immediate and in the direction expected. This appears to exemplify the industry-wide information contained in profit warning announcements.

Han, Wild & Ramesh (1989) conducted a study examining the security return behaviour of firms that voluntarily release managers' earnings forecasts and the impact these disclosures had on other firms in the same industry. After removing industry cross-sectional co-variation in the forecast firms' security returns, they found that a significant portion of the information conveyed in such announcements is related to firm specific factors. This suggests that earnings announcements convey two distinct forms of information content, industry-wide information (as described by Firth (1976)) and firm-specific information. Jin (2004) studied the effects of both industry-wide factors and firm-specific factors on share prices by decomposing accounting earnings into expenses and revenues. He found that a negative accounting earnings report, conveying firm-specific factors, had a negative impact on the announcing firms share price but a positive impact on the share price of other firms in the same industry (competitive effect). It was also found that an announcement conveying industry-wide factors resulted in a positive correlation between the movements of returns of the announcing firm and the competing firms in the same industry (contagion effect). These results are in accordance with studies analysing intra-industry information transfers by Szewczyk (1992) and Tawatnuntachai & D'Mello (2002).

The extent to which intra-industry information transfers occur is influenced by a confluence of factors (Jackson & Madura, 2003). Defeo (1986) investigated the speed of price adjustments to earnings announcements relative to other sources of variation,

such as firm size, reporting lag and report type. He found that the share price movements began earlier and lasted longer for bigger firms in comparison to smaller firms. Foster (1981) conducted research on sales, earnings and advertising expenditure announcements and the intra-industry information transfers that occur. His research found that the level of competition for market share was particularly pertinent in industries, and that highly competitive industries experience more pronounced information transference. Kohers (1999) found that the effects of announcements were more profound within homogenous industries, defined in his studies as regulated industries including banks and utilities. Jackson & Madura (2003) carried out research into the effects of profit warnings released at various times leading up to compulsory annual reports. They found that the mean two day CAR of the firms that issued profit warnings more than one month in advance is −15.25%, versus −13.64% for firms that issued profit warnings less than one month in advance. The difference between the means was found to be statistically insignificant; therefore they inferred that there are no differences as a result of the timing of the profit warning announcement.

It may not be the case, that all forms of announcements by firms have significant impact on share prices and returns. Fama, Fisher, Jensen and Roll (1969) investigated the information contained in the announcement of stock splits. They discovered that the stock splits themselves had no influence on share price movements, although the announcements did have an indirect influence on share prices through the increase of cash dividends. Ball & Brown (1968) found, in a study of 261 American firms and the impact annual report announcements have on share prices, that the actual release of the earnings announcements by the firms had relatively little impact on share prices. Szewczyk (1992) studied announcements of common stock and securities convertible into common stock. He found that responses to offering announcements of non-convertible securities are typically negative[7] but not statistically significant.

[7] The announcement of an impending public offering seems to communicate unfavourable inside information about the announcing firm's value. The negative returns found by Szewczyk (1992) were confirmed by Ross (1977), who advanced a theory in which leverage-decreasing transactions, such as new issues of common stock and convertible securities, signal management's lack of confidence in the firm's future profitability.

Many studies have been conducted to ascertain the incentives of voluntarily disclosing relevant information to the public. The South African stock exchange contains several listing rules which dictate the appropriate disclosure practices. JSE Listing Rule 3.4[8] and JSE Listing Rule 3.9[9] are particularly relevant for the purposes of this paper. In general, directors can assess if the disclosure of information would lead to a substantial price movement. In addition, directors are able, if they desire (despite the requirement for prompt disclosure), to either fail to disclose before reporting financial results, delay disclosure, or disclose through a private disclosure channel (Skinner, 2004).

Several factors may create an environment more conducive to voluntary disclosure. Skinner (1994) found that managers are more likely to release earnings forecasts if their respective firms are performing well. Whilst Dontoh (1989) showed that managers operating in oligopolistic markets are more likely to disclose both good and bad news, in an attempt to provide both good news to shareholders and bad news to competitors. Helbok & Walker (2003), focusing exclusively on profit warnings, found that the willingness of managers to disclose is associated with the permanence of the news. Darrough & Stoughton (1990) analysed the voluntary disclosure of proprietary information. They found that disclosed information can help the financial market in evaluating the firm's value more accurately; however it may also provide strategic information to potential competitors. Therefore the manager's decision to disclose is based on the effect of information on the assets market price. Darrough & Stoughton (1990) reveal that firms in less competitive industries may see no costs associated

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[8] JSE Listing Rule 3.4 – under General Obligation of Disclosure states that the following provisions apply in respect of material price sensitive information:

> With the exception of trading statements, an issuer must, without delay, unless the information is kept confidential for a limited period of time in terms of paragraph 3.6, release an announcement providing details of any development(s) in such issuer's sphere of activity that is/are not public knowledge and which may, by virtue of its/their effect(s), lead to material movements of the reference price of such issuer's listed securities.

[9] With regards to Cautionary announcements Cautionary announcements listing rule 3.9 states that:
> Immediately after an issuer acquires knowledge of any material price sensitive information and the necessary degree of confidentiality of such information cannot be maintained or if the issuer suspects that confidentiality has or may have been breached, an issuer must publish a cautionary announcement (complying with paragraph 11.40). An issuer that has published a cautionary announcement must provide updates thereon in the required manner and within the time limits prescribed in paragraph 11.41.

with making public disclosures. Their research suggests that full disclosure takes place when the market conditions are favourable enough to support two or more firms. This insinuates that the greater potential costs associated with non-disclosure in highly competitive markets, results in competition *encouraging* voluntary disclosure. Verrechia's (1983) results contradict the findings of Darrough *et al* concluding that product market competition may provide disincentives for voluntary disclosure through the competitive effect.

Skinner (1994) found that on average, earnings related voluntary disclosures occur infrequently, approximately one disclosure for every ten quarterly earnings announcements[10]. More specifically, he found that good news disclosures tend to be point or range estimates of earnings per share (EPS), whilst bad news disclosures were usually qualitative statements concerning the current quarter's earnings. Collett (2004) studied the quantitative reports released by firms, finding that the proportion of companies disclosing quantitative updates is relatively low (35% for profit warnings and 42% for upgrades), but that the information is value relevant.

Research done by Patell (1976), Penman (1980), Waymire (1984), and Lev & Penman (1990) document that managers disclose good news forecasts more often than bad news forecasts and, on average, that there is a positive stock price response to managers' earnings forecasts. Collett (2004) disagrees, finding that negative trading announcements outnumber positive trading announcements by 50%. Skinner (1994) found that share price movements, for bad news disclosures, were more severe than for good news disclosures[11]. He states that "overall, the evidence is consistent with the idea that managers face an asymmetric loss function in choosing their voluntary disclosure policies. Managers behave as if they bear large costs when investors are surprised by large negative earnings news, but not when other earnings news is announced." Collett (2004) agrees with these findings, asserting that there is a greater reaction to unscheduled announcements which contain a profit warning. Skinner (1994) posits two reasons for the severity of bad news announcements; firstly, the

[10] His paper provides evidence on corporate voluntary disclosure practices through an examination of the earnings-related disclosures made by a random sample of 93 NASDAQ firms from 1981-1990.
[11] Quarterly earnings announcements that convey large negative earnings surprises are pre-empted about 25% of the time by voluntary corporate disclosures while other earnings announcements are pre-empted less than 10% of the time.

threat of litigation by shareholders who may claim that management were "negligent on failing to disclose value relevant information", and secondly, managers may incur reputation costs for failing to disclose. Collett (2004) agrees, and presents results suggesting that managers recognise both the potential legal and reputation costs of failing to disclose value relevant information.

Skinner (1994) asserts that money managers, shareholders, security analysts, and other investors dislike negative earnings surprises, and "may impose costs on firms whose managers fail to disclose any potential earnings problems in a timely manner". Collett (2004) reports, that the directors of firms choosing to disclose trading updates to a favoured group of investors may sustain considerable penalties. Lundholm (1996) concluded in his study that firms can attract analysts[12], improve the accuracy of market expectations, reduce information asymmetries and limit market surprises by adopting more forthcoming disclosure practices. He emphasizes that firms with prompt disclosure records can lower their cost of capital; as an increase in the analysts' confidence in a firm, can result in a larger pool of potential investors. Collett (2004) reports extensively on small companies which are not followed by analysts and finds that the level of surprise is much greater for small company announcements than for large company announcements. Research conducted by Jackson & Madura (2003) established similar results. For small companies there is some over-reaction to bad news, suggesting either that "large companies manage their disclosures carefully so that news trickles out, or that large companies convey information to analysts informally more than five days before the public announcement".

Many directors choose to manage analyst's expectations, through either earnings management[13] or forecast guidance[14], so as to ensure that expectations are always met or exceeded (Matsumoto, 2002). Matsumoto (2002) found that firms with "higher transient institutional ownership are more likely, and firms with a consistent record of prior losses are less likely, to both manage earnings upwards and guide forecasts downwards; whereas high growth firms appear to do the opposite". In accordance

[12] Either because these disclosures increase the demand for analyst's reports or because they reduce analysts' costs of supplying them.
[13] Achieved when mangers use their discretion over reported earnings to meet expectations.
[14] Achieved by guiding analysts' earnings forecasts downward to improve their firms' chances of meeting or beating the forecast when earnings are announced.

with Matsumoto, Aboody & Kazniks (2000) found evidence for the fact that managers act opportunistically in structuring the financial reporting strategy of their respective firms.

The contribution of this paper to the existing literature is three-fold. Firstly, previous studies conducted on profit warnings in South Africa have utilised the JSE All Share Index as a proxy for the return on the market, while this paper uses All Share Economic Group Indices as the proxy for expected returns. This greatly increases the accuracy of the abnormal returns calculated for each industry. Secondly, an explanatory variable describing the level of competition in each industry is included in the multivariate regression explaining the movement in returns of the non-announcing firms. Finally, only one similar study has been conducted using South African financial data.

This paper will proceed as follows. Section II describes the large data-set used in the study. Section III sets out the methodology employed to test the effects of profit warnings on announcing firms and non-announcing firms in the same industry; the variables affecting the returns experienced by non-announcing firms over a ten day period are also analysed. Section IV reports the market model and regression results, and some concluding remarks are offered in section V.

II The Data

A number of sources of data have been used in this study – firstly, the share prices for 409 public firms listed on the Johannesburg Stock Exchange (JSE) between May 1999 and February 2004 were obtained from DataStream. Secondly, profit warnings made by JSE listed companies between the same dates were collected from McGregor BFA. All optional disclosures with repercussions for annual earnings were included; this includes both quantitative and qualitative statements. Thirdly, the values for the All Share Index and All Share Economic Group Indices between September 1998 and March 2004 were gathered. Finally, accounting ratios were obtained for the 409 public firms considered in this study, more specifically, the earnings/price ratio's (EPR), return on equity (ROE), Market Value of Equity and earnings per share (EPS) were calculated for each firm. The remainder of this section describes the salient features of these sets of data and considers some important aspects in turn.

2.1 Share Prices

The share prices considered in this study were the daily share prices obtained from the JSE concerning the relevant companies under study[15]. The actual share prices utilized in the study were those prices for the four days prior to a profit warning up until five days post the profit warning. The share prices are stated in South African cents.

2.2 Profit Warnings

The profit warnings were classified as either containing firm specific information or industry-wide common information. This distinction was based on a profit warning document which explicitly defines firm specific profit warnings versus industry-wide profit warnings.[16] All profit warnings released on the JSE were considered, however those with certain characteristics were excluded. Firstly, the occurrence of simultaneous announcements by two firms in the same industry was circumvented by eliminating both profit warnings from the study. Secondly, announcements made

[15] Share prices were stated for working days only. This excludes weekends and all public holidays, since the markets are closed on these days.

[16] See appendix A - The Appendix provides the basis on which profit warnings were classified and lists two examples of the actual announcements.

within two days of each other were dropped from the data set. Both prohibiting characteristics were implemented so as to ensure that the study considered the effects on the market of a single profit warning released by a single firm within a stipulated window period.

In addition, the following forms of announcements were excluded. This was to ensure that the study focused on the share price responses to profit warnings only, as advocated by Yiannakis (2006) & Gihwala *et al* (2008).

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- Announcements that provide half year earnings along with a warning about future earnings are removed from the sample.
- Announcements that include other information, such as dividend announcements are removed, as the market reaction could not be entirely attributed to the warning announcement.
- Firms exhibiting confounding events were excluded from the dataset. These include events such as share repurchase announcements or acquisition announcements within a two day window of the profit warning.
- The Diversified Financials industry was excluded from the dataset since a strong information transfer effect was not expected to occur in this industry.
- Announcing firms that did not trade on the day of a profit warning were also excluded from the data-set. This was due to the fact that there was not an expectation of an information transfer since the announcing firm would not be able to react to its own profit warning.

2.3 All share index & All Share Economic Group Indices

All eligible listed companies are included in at least one of the FTSE/JSE Africa Headline Indices[17]. The eligible companies are ranked by full market capitalization (before free float weightings are applied). The top 99% of all companies are included in the FTSE/JSE Africa All Share Index (J203) with the remaining 1% forming the FTSE/JSE Africa Fledgling Index. The All share index measures the performance of all publicly listed companies at any particular point in time.

The ten economic group indices used were (including codes): Oil & Gas (J500), Basic Materials (J510), Industrials (J520), Consumer Goods (J530), Health Care (J540), Consumer Services (J550), Telecommunication (J560), Utilities (J570), Financials (J580) and Technology (J590). The economic group indices measure the performance of a particular economic group at any given point in time. Securities are classified according to the FTSE Global Classification System, first into economic groups and then into sectors and sub-sectors (The FTSE/JSE Africa Index Series: A Comprehensive Guide, 2006)[18].

2.4 Accounting Ratios

The Market value of equity is equivalent to the number of shares issued at the end of the year multiplied by the share price at the end of the year. The price-earnings ratio is defined as the closing share price on the last day of the company's financial year divided by the pre-abnormal earnings per share. Earnings per share is commonly calculated as the net profit after tax before, abnormal share prices, less outside equity interests and preference dividends, divided by the diluted weighted number of shares outstanding during the year. Return on Equity is equal to net profit after tax (NPAT) before abnormal share prices, divided by, shareholders equity minus outside equity

[17] CALCULATING THE INDICES:

All indices in the FTSE/JSE Africa Index Series are calculated between 09h00 and 17h00 on all days when the JSE is open for trading. All indices in the series are calculated using the formula:

$$\textbf{Index} = \frac{\text{Sum of Free Float Market Capitalization of All Constituent Companies}}{\text{Latest Index Divisor}}$$

[18] See Appendix B – The appendix delineates the placement of JSE sectors under the relevant economic group indices.

interests. Return on Equity is a key indication of the company's performance as it provides information on how well managers are employing funds invested by the shareholders to generate returns (Yiannakis, 2006). All accounting ratios are for the year end, closest to the announcement of the profit warning.

III Methodology

This paper uses two alternative methods to identify the stock price response of the announcing and non-announcing firms to the announcement of a profit warning. Firstly, the event study methodology will be used to estimate daily abnormal returns for the 10 day window (t-4, t+5). Secondly a cross-sectional regression analysis is devised to broadly examine the variables that influence the industry effects of profit warnings.

3.1 Event Study Methodology

Initially, a working set of industry groups was established. These groups were established according to the FTSE Global Classification System. A standard event study methodology is used to measure share price reactions to the profit warning announcements. Day 0 in event time is defined as the date of the earliest profit warning report recorded by the JSE. Profit warnings by other firms, recorded in the same industry around the original profit warning announcement, days (t-2, t+2), will be excluded to ensure that the profit warning of the announcing firm, rather than profit warnings of the other firms, is driving the observed market reactions around the warning announcement (Yiannakis, 2006).

The abnormal return for an announcing firm is the deviation of its common share's actual return from a contemporary expected return generated by the market model[19] (Szewczyk, 1992). "Various researchers have tested the validity of using this model and all have found it to offer a satisfactory measurement technique" (Firth, 1976). Clinch & Sinclair (1987) assert that the results obtained using the market model and other methods such as the recursive system are similar. In this study, the market model's parameters are estimated over a 250 trading-day estimation period beginning 250 days prior to the announcement. Abnormal returns are measured over days (t-4, t+5) (10 day event window). The test methodology utilised was to calculate the cumulative average abnormal returns, which are then used to evaluate the significance of the intra-industry information transference.

[19] The market model was first suggested by Sharpe (1963, 1964).

The market model parameters are estimated using ordinary least squares applied to the following model:

(1) $$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where:

→ R_{it} is the return for share i at time t.

→ R_{mt} is the market return during the period t measured by the relevant Economic Group Index.

→ α_i is the average rate of return the share would realise in a single time period where the market return is zero.

→ β_i is the coefficient of volatility of share i's return in relation to the market return,

→ ε_{it} is the regression residuals.

The expected normal returns for share i at time t are then calculated by taking the expectation of (1), producing the following model:

(2) $$E(R_{it}) = \alpha_i + \beta_i R_{mt}$$

Where:

→ $E(R_{it})$ is the expected return on share i at time t.

→ α_i and β_i are the parameters of the market model.

→ R_{mt} is the market return as already defined.

To estimate the effects of the profit warning announcement on the announcing firm's returns, abnormal returns are calculated as stipulated by Szewczyk (1992).

(3) $$A(R_{it}) = R_{it} - E(R_{it})$$

Where:

→ $A(R_{it})$ is the abnormal share return for share i at time t.

The remaining variables in the above model are as previously defined[20].

[20] See equation (1) and (2).

The average abnormal returns (AAR) for each day and cumulative abnormal returns (CAR) are estimated over the event period and a students t-test is used to verify whether mean and cumulative abnormal returns are statistically significant or not.

$$(4)\ AAR_t = \frac{1}{n}\sum_{i=1}^{n} AR_{it}$$

$$(5)\ ACAR_{ab} = \sum_{t=a}^{b} AAR_t$$

Where:

→ AAR_t is the average abnormal return at time t.

→ CAR_{ab} is the average cumulative abnormal return from time a to time b.

To ascertain the impact of a profit warning announcement on the share price of competing firms in the same industry, average abnormal returns are estimated for a random sample of competing firms over the ten day event window. In this study, industries which contained at least two and not more than ten competing firms, for every announcing firm, were considered[21]. As this study discriminates between profit warnings classified as firm specific and those classified as industry-wide, the above analysis is conducted for both cases.

3.1 Cross-Sectional Regression Analysis

In order to establish the significance of various proposed factors affecting the abnormal returns of non-announcing firms, a cross-sectional regression analysis is performed. This study considers six explanatory variables, namely: CARA, LNMVE, HOMOG, GROWTH, SENT and COMPET[22]. The cumulative abnormal returns over the two day event window, (t=0, t+1), of the non-announcing firms are regressed on the six explanatory variables.

[21] As specified in a similar study conducted by Gihwala *et al* (2008)
[22] As suggested by Yiannakis (2006).

The following model is estimated to examine the six explanatory variables that affect the returns of the non-announcing firms over the two day event window:

(6)

$$CAR = \alpha + \beta_1 CARA + \beta_2 LNMVE + \beta_3 HOMOG + \beta_4 GROWTH + \beta_5 SENT + \beta_6 COMPET + \varepsilon$$

Where:

→ CAR is the two-day (t=0, t+1) cumulative abnormal return for the *non-announcing firms*.

→ CARA is the two-day (t=0, t+1) cumulative abnormal return for the *announcing firms.*

→ LNMVE is the size of the firm issuing the profit warning. This is measured by taking the natural log of the market value of equity 20 days prior to the profit warning announcement, i.e. t-20.

→ HOMOG is a dummy variable taking the value of 1 for homogeneous industries (e.g. Banking, Energy and Utilities industries) and 0 otherwise. Homogenous industries can be defined as industries that are similar in terms of the product or service offering or the general operating environment. [23] Homogeneity of industries is controlled for as the level of competition in an industry is an important factor in explaining industry abnormal returns (Kohers, 1999).

→ GROWTH is a measure of the growth of the announcing firm and is measured using the earnings-price ratio (a higher earnings-price ratio implies lower growth). The growth of the announcing firm is a proxy for the growth of the entire industry. This study controls for a firm's growth prospects, since a profit warning may reflect a more severe signal to a high growth industry (Defeo, 1986).

→ SENT is an indicator of market sentiment. It provides an indication of the underlying 'mood' in the market over the 20 day period prior to the profit warning announcement. In this study, market sentiment is estimated by measuring the

[23] Specifically, the Banking and Utility industries are characterised as homogeneous, due to the regulatory constraints, greatly limiting the potential to diversify. The Energy industry is characterised as homogeneous due to the relatively standardised products and services (Gihwala *et al*, 2008).

holding period return on the JSE All Share Index. This study controls for market sentiment at the time of each profit warning since a profit warning may result in an over-reaction by the market in declining markets (Lang & Stulz, 1992).

→ COMPET is a measure of the level competition prevalent in the industry. It is measured by using the Herfindahl Index[24] of industry concentration[25], which is a proxy for the degree of imperfect competition in an industry. In a perfectly competitive industry, shareholders of existing firms cannot earn rents from an increase in demand. In less competitive industries, however, the increase in demand increases the present value of the rents to shareholders because the firms whose demand increases, can raise the price for their current output (Lang & Stulz, 1992).

→ ε is the regression error term.

IV Results

[24] See Appendix C for explanation of the Herfindahl Index.

[25] The Herfindahl Index of each industry is obtained by dividing an individual firms' market value of equity for a given year, by the total industry market value of equity for the same year. This is done for each firm in a given industry, resulting in the market share of each firm. The market share of each firm in the industry is then squared and summed to provide the index value for the specific industry.

The following section initially provides descriptive statistics pertaining to the data-set. The abnormal returns calculated for the sample including firm specific and industry-wide profit warnings (full sample) were then subjected to statistical analysis. The sample containing exclusively firm specific profit warnings and the sample containing exclusively industry-wide profit warnings were then also tested. Finally, the cross-sectional regression was conducted to establish the significance of various proposed factors affecting the abnormal returns of non-announcing firms.

4.1 Descriptive Statistics

124 profit warnings were assessed in the study; similar to research conducted by Gihwala *et al* (2008). Of these profit warnings, 51 were deemed legitimate as delineated in section II[26]. The significant reduction in sample size was necessary so as to ensure the integrity of the results. More specifically, if the study had been conducted on the entire 124 profit warning sample, it would have been impossible to establish the true effects of intra-industry information transfers. The breakdown of the remaining 51 profit warnings into firm specific and industry-wide profit warnings is detailed in Table 1.

Table 1: Profit Warnings segmented by source of warning

	1999	2000	2001	2002	2003	Total
Sample by source of warning						
Total Sample	12	23	9	4	3	51
Industry-Wide	3	7	1	0	2	13
Firm Specific	9	16	8	4	1	38

A total of 28 industries are represented in the data-set. The frequency distribution of industries in which announcing and non-announcing firms are placed, displays a relatively even dispersion of profit warning announcements[27]. There were a total of 231 non-announcing firms, which were evenly distributed amongst the respective industries. The average number of competing firms per profit warning in an industry was 4.53. As delineated in the methodology, no less than 2 and no more than 10 competing firms in an industry, per profit warning, were considered. The diversified

[26] Section 2.2 outlines the filters applied to profit warnings in this study.
[27] See Appendix D for frequency distribution of industries for announcing and non-announcing firms.

industrials industry contained the highest percentage of total announcing firms with 9.09%. 11 out of the 24 industries in which profit warnings were made, contained only a single announcement.

After the announcing firms had been positioned into their respective industries, the accounting ratios for each of these firms were recorded. Average figures were then calculated for each accounting ratio in each industry. Table 2. highlights the average market capital, competition levels, price-earnings ratio, return on equity, earnings per share (cents) and sentiment levels for each industry.

Table 2: Accounting Ratios for Announcing Firms

The average values for the full sample provides an insight into the financial

Industry	Average MCAP (Rm)	Competition	Average PER	Average ROE	Average EPS (cents)	Sentiment
-						
Auto Parts	484.86	5441.24	8.27	11.90	150.40	0.08
Banks	21296.41	2236.02	8.04	10.15	171.75	0.07
Building & Construction Materials	20336.35	4848.35	6.42	13.23	182.55	0.02
Business Support Services	2887.04	8410.15	8.91	12.43	143.45	-0.06
Chemicals - Speciality	1589.90	5249.13	8.66	4.36	95.48	-0.14
Computer Services	429.33	4054.15	7.07	-13.90	30.61	-0.10
Containers & Packaging	1631.48	8516.59	-4.33	18.23	39.60	-0.05
Diamond	588.38	9799.71	4.21	6.19	54.03	-0.01
Diversified Industrials	60.80	4075.57	8.15	-50.18	228.20	-0.03
Electrical Equipment	1505.46	3174.91	5.19	10.44	140.94	0.09
Electronic Equipment	38.79	4693.56	-3.94	-25.38	-1.35	0.02
Engineering - General	159.31	3305.68	1.78	7.63	67.53	-0.05
Farming & Fishing	601.65	2631.23	4.35	15.00	102.29	-0.02
Food & Drug Retailers	3757.54	3706.05	18.31	43.30	47.60	-0.14
Gold Mining	7922.33	3840.87	4.47	-8.08	371.89	-0.04
Insurance - Non-Life	3943.29	5002.71	18.54	15.60	263.07	0.02
Investment Banks	3047.23	7201.28	5.02	23.59	102.40	-0.03
Investment Companies	131.42	6073.47	0.30	-55.04	12.65	0.09
Life Assurance	16068.63	3235.35	11.37	15.18	189.65	0.02
Metals & Minerals	41660.50	5312.08	5.18	21.40	217.66	-0.09
Other Construction	1253.15	3990.54	4.07	2.20	72.76	0.04
Other Financial	554.16	8526.18	7.69	-76.60	12.28	-0.01
Publishing & Printing	1027.54	9690.60	11.37	0.50	262.22	-0.10
Real Estate Holdings & Development	318.71	1355.09	5.96	2.00	71.08	-0.02
Restaurants and Pubs	105.76	6535.48	0.65	13.30	19.73	-0.10
Retailers - Hardlines	1237.76	6584.25	8.57	17.92	246.43	0.04
Retailers - Multi Department	1826.97	2865.74	7.88	21.84	-20.32	-0.11
Retailers - Soft Goods	716.62	3478.66	10.64	1.91	2.31	-0.11

performance of the firms in the study. A value of 5147.67 on the Herfindahl index is indicative of a relatively low level of competition within the industries under examination. The positive price-earnings ratio (6.51) exemplifies the expectation of the market, that future earnings are expected to exceed current earnings. Return on Equity (ROE) is a key indication of the company's performance as it provides information on how well managers are employing funds invested by the shareholders to generate returns (Yiannakis, 2006). The positive earnings per share (EPS) and ROE ratios are indicative of excellent recent performances for the firms recording profit warnings. The Gold Mining sector recorded the highest earnings per share (EPS), 371.89 cents per share. Whilst the sector exhibiting the highest ROE were the Food and Drug Retailers at 43.30%, which was significantly greater than the second highest industry, which was Shipping and Ports at 29.02%. The average market sentiment for the full sample was found to be slightly negative at -0.02 %. This indicates that the 'mood' of the market was marginally negative prior to the profit warning announcements.

4.2 Event Study Results

The average abnormal returns of firms are now examined. Table 3. reports the average abnormal returns, for the period (t-4, t+5), and average cumulative abnormal returns around the announcement of 51 profit warnings between January 1999 and December 2003. The average abnormal returns for the non-announcing firms at time (t) were calculated by summing the abnormal returns of each non-announcing firm in an industry, and then dividing this value by the number of non-announcing firms in the same industry. The average cumulative abnormal returns are obtained by summing the abnormal returns for each day, over an event period. Table 3, 4 and 5. presents the average cumulative abnormal returns for the following event periods: (t-1, t=0) (t=0, t+1) (t-1, t+1) and (t-2, t+2). The abnormal returns were calculated using the market model as specified in section III.

Table 3: Effects on Returns in Response to Profit Warning Announcements - Full Sample

Average Abnormal Return (%)

Day Relative to Announcement	Announcing Firms	Non-Announcing Firms
-4	-7.99%	-1.82%
-3	-28.42%	2.25%
-2	-9.95%	0.83%
-1	-8.10%	-2.75%
0	-11.47%	-5.61%
1	3.79%	0.73%
2	-14.16%	-0.78%
3	-8.24%	-1.30%
4	-25.66%	7.46%
5	7.09%	4.90%

Average Cumulative Abnormal Return (%)

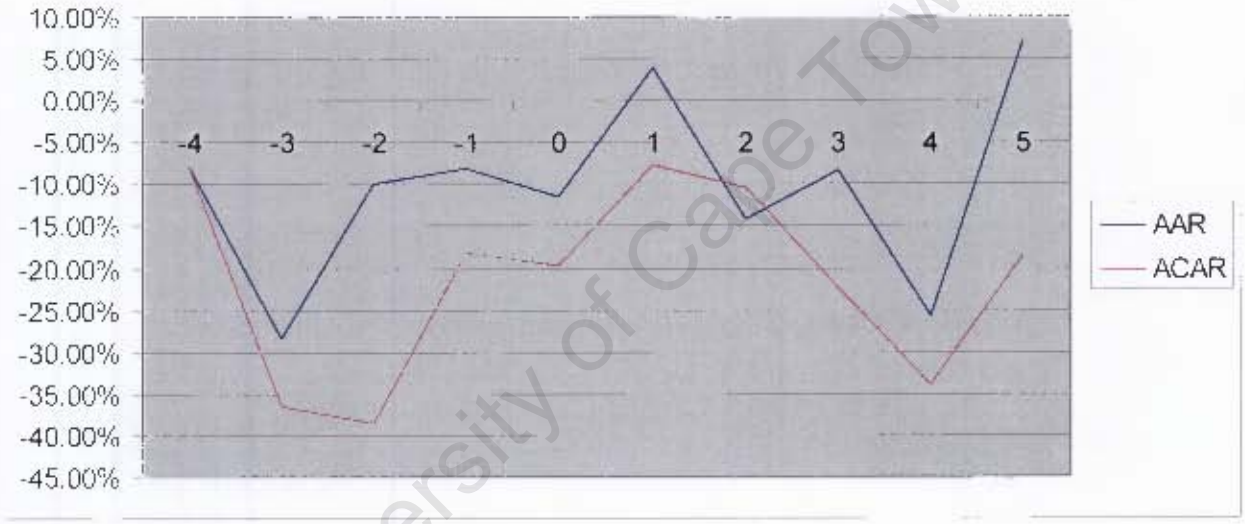
Day Relative to Announcement	Announcing Firms	Non-Announcing Firms
-1 to 0	-19.58%	-8.36%
0 to +1	-7.68%	-4.87%
-1 to +1	-15.79%	-7.62%
-2 to +2	-39.89%	-7.58%
N	51	51

Firstly, the results of the announcing firms will be reported. The largest negative abnormal returns for the announcing firms, found to be (-28.42%) occurred at t-3. This was closely followed by the large negative abnormal returns at t+4 of (-25.66%). The large negative abnormal returns may have been exacerbated by the general negative sentiment apparent in the market prior to the announcements. The average cumulative abnormal returns over a two day period were largest over (t-1, t=0) at (-19.58%) in comparison to (-7.68%) for the period (t=0, t+1). The market appears to have anticipated the profit warning prior to the announcement and therefore adjusted the share price downwards accordingly as proposed by Jackson & Madura (2003). It may be the case that information leakages have occurred to alert the market. The marginally positive abnormal returns at t+1 of

(3.79%) appears to suggest that the market experienced a slight correction, perhaps as a result of an over-reaction to the profit warning. This is precisely what was found in a similar study conducted by Collett (2004). Despite this, the abnormal returns then drop drastically over the period (t-2, t=4), finally making a recovery at t+5.

Figure 1, graphically demonstrates the average abnormal returns and average cumulative abnormal returns over the event window for the full sample of announcing firms.

Figure 1: AAR and ACAR for Full Sample of Announcing Firms



The abnormal returns of the non-announcing firms appear to be less pronounced for the full sample in accordance with Foster (1981). The largest negative abnormal returns recorded were at t=0 of (-5.61%) which was expected[28]. Again, the largest drop in the share price occurred over the period (t-1, t=0) of (-8.36%), which adds further evidence to the claim that markets anticipate profit warning announcements. An identical pattern to the announcing firms was established whereby there appears to have been a slight correction at t+1 of (0.73%), followed by a period of decline, concluding with a recovery over the period (t=4, t=5).

[28] Clinch & Sinclair (1987), Foster (1981) and Helbok & Walker (2003) found that information transfers were directional.

Table 4: Effects on Returns in Response to Profit Warning Announcements – Firm Specific Sample

Average Abnormal Return (%)

Day Relative to Announcement	Announcing Firms	Non-Announcing Firms
-4	-4.50%	1.16%
-3	0.96%	0.56%
-2	4.99%	-0.41%
-1	-8.47%	-1.03%
0	0.30%	-2.84%
1	2.63%	-2.10%
2	-8.81%	-5.41%
3	-12.01%	-2.70%
4	-7.34%	4.32%
5	-3.63%	7.18%

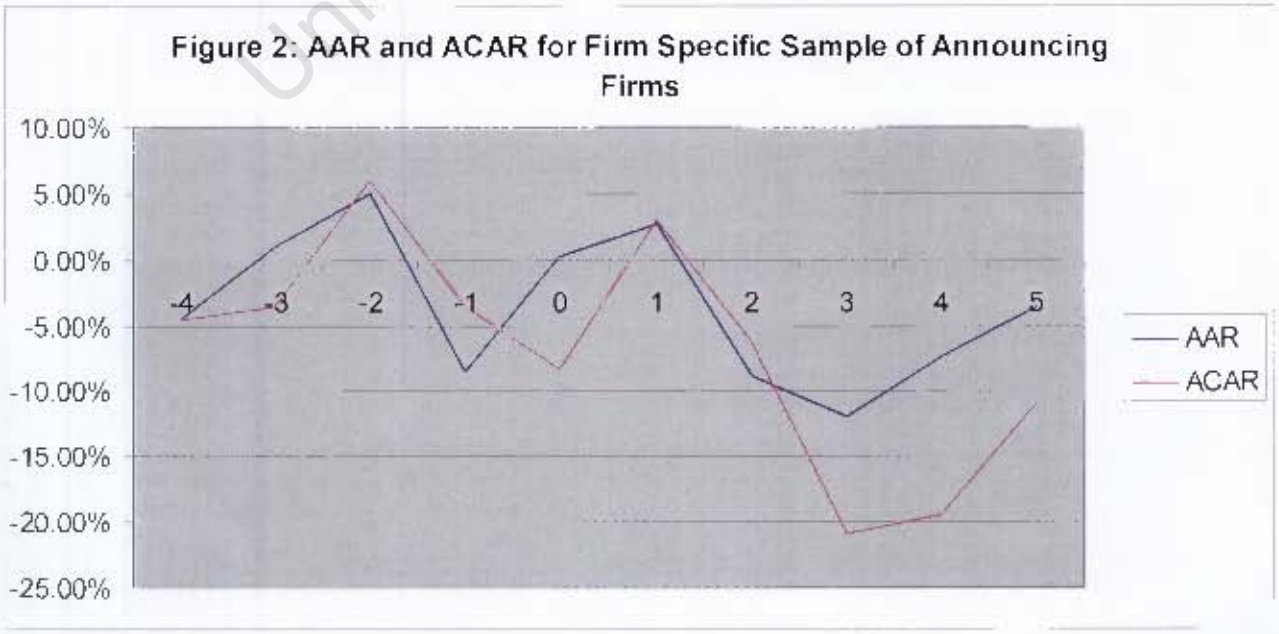
Average Cumulative Abnormal Return (%)

Day Relative to Announcement	Announcing Firms	Non-Announcing Firms
-1 to 0	-8.17%	-3.87%
0 to +1	2.93%	-4.94%
-1 to +1	-5.54%	-5.96%
-2 to +2	-9.36%	-11.79%
N	38	38

The 38 firm specific profit warnings were assessed, as shown by Table 4. Again, the results of the announcing firms will be reported first. The negative abnormal returns for the firm specific sample where less pronounced than those of the full sample. The largest negative abnormal returns for the announcing firms, found to be (-12.01%) occurred at t+3. This was followed by the negative abnormal returns at t+4 of (-8.81%). The average cumulative abnormal returns were largest over the two day period (t-1, t=0) at (-8.17%) in comparison to (2.93%) for the period (t=0, t+1). At first glance, the market appears, to some extent, to have anticipated the profit warning prior to the announcement, shown by the negative abnormal returns at t-4 of (-4.50%). This marginal drop in share price appears to

have been offset by gains in abnormal returns over the following two day period (t-3, t-2). However the fluctuating direction of abnormal returns prior to the announcement of the profit warning, from negative to positive and then back to negative again, may simply represent share price movements resulting from other market factors. As in the full sample case, a significant negative abnormal return is experienced the day before the profit warning, suggesting some degree of information leakage. However, in contrast to what was expected, the announcing firms appear to have exhibited a positive reaction to the firm specific profit warnings on the day of the announcement as well as on the day following the announcement, again, in accordance with Collett (2004). It may be the case, that at first, the market is waiting to see the effects on the share price of the announcement at t=0, resulting in the movements of abnormal returns on the day of the warning being muted. This brief period of consolidation appears to be followed by four consecutive days of significant negative returns, perhaps representing the eventual verdict of the market and subsequent action. The pattern of abnormal returns followed by the announcing firms appears to be frenzied as shown in Figure 2.

Figure 2, graphically demonstrates the average abnormal returns and average cumulative abnormal returns over the event window for the firm specific sample of announcing firms.



Again, the abnormal returns of the non-announcing firms appear to be significantly less pronounced for the firm specific sample. This is as expected, since the degree if intra-industry information transfers are expected to be lower for firm specific profit warnings. The largest negative abnormal returns recorded were at t=2 of (-5.41%). The largest drop in the share price occurred over the period (t=0, t+1) of (-4.94%), however a similar drop occurred over the period (t-1, t=0). The pattern of abnormal returns for non-announcing firms appears to be that of positive abnormal returns over the period (t-4, t-3) and (t+4, t+5) and negative returns over the period (t-2, t+3). This appears to follow a more consistent pattern as the negative effects of the profit warnings are centralised around the actual announcement date, suggesting some degree if intra-industry information transference, however, this effect is small.

Table 5: Effects on Returns in Response to Profit Warning Announcements – Industry-Wide Sample

Average Abnormal Return (%)

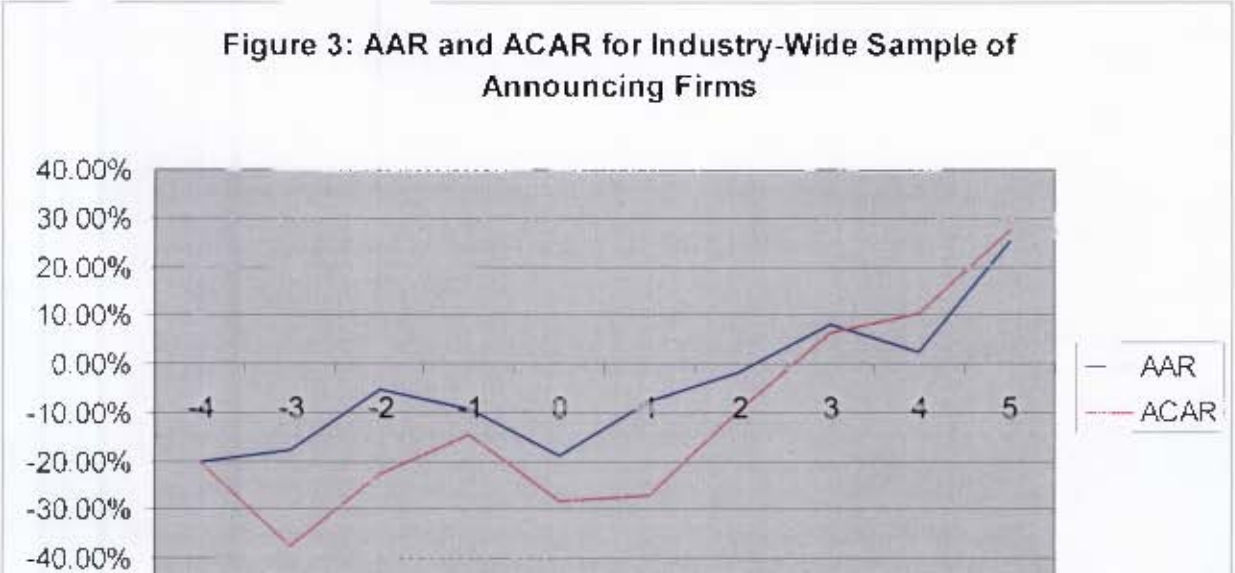
Day Relative to Announcement	Announcing Firms	Non-Announcing Firms
-4	-20.13%	-11.27%
-3	-17.55%	-7.81%
-2	-5.12%	-2.92%
-1	-9.28%	-8.21%
0	-19.09%	-19.60%
1	-7.80%	11.83%
2	-1.38%	7.77%
3	8.02%	1.52%
4	2.61%	3.31%
5	24.87%	1.53%

Average Cumulative Abnormal Return (%)

Day Relative to Announcement	Announcing Firms	Non-Announcing Firms
-1 to 0	-28.37%	-27.81%
0 to +1	-26.89%	-7.77%
-1 to +1	-36.18%	-15.97%
-2 to +2	-42.68%	-11.12%
N	13	13

Table 5. highlights the abnormal returns for the industry-wide sample. Starting with the results of the announcing firms; the negative abnormal returns for the industry-wide sample were slightly more pronounced than the full sample, particularly in the case of the non-announcing firms, which was expected. The largest negative abnormal returns for the announcing firms, found to be (-20.13%) occurred at t-4. This was followed by the negative abnormal returns at t=0 of (-19.09%). The average cumulative abnormal returns were largest over the two day period (t-1, t=0) at (-28.37%) which were only marginally greater than the abnormal returns over the period (t=0, t+1), found to be (-26.89%). Again, we see an early anticipation of the profit warning (in accord with Jackson & Madura (2003)); however the negative returns are considerably more pronounced for the industry-wide sample in comparison to the firm-specific sample. This provides further evidence of an information leakage. Moreover, industry-wide profit warnings covey pessimistic information about the industry as a whole, which may be easier for analysts and shareholders to anticipate, therefore these results, would be expected. The negative returns start at t-4 and continue up until t+2, after which the share prices experience a gradual recovery ending with a large positive movement in abnormal returns of (24.87%) at t+5; these findings contradict Jackson & Madura (2003) who found no evidence of a reversal post-announcement. This reversal can be clearly seen in Figure 3.

Figure 3. graphically demonstrates the average abnormal returns and average cumulative abnormal returns over the event window for the industry-wide sample of announcing firms.



As in the previous two samples, the abnormal returns for the non-announcing firms are slightly less pronounced than for the announcing firms, agreeing with the findings of Foster (1981). We do however see a similar pattern in the movements of the abnormal returns for both types of firms (announcing and non-announcing). The largest negative abnormal returns recorded were at t=0 of (-19.60%). The largest drop in the share price occurred over the period (t-1, t+0) of (-27.81%), which was followed by a smaller drop of (-7.77%) over the period (t=0, t+1). The primary difference between the pattern followed by the abnormal returns of announcing firms, in comparison to those of the non-announcing firms, is that for the non-announcing firms, the negative abnormal returns conclude at t=0, and then become positive thereafter. This may be due to the fact that the announcing firms are perceived as being particularly vulnerable to the recent industry-wide events, and therefore experience negative returns for a longer period of time. We do however observe significant similarities in the patterns of announcing and non-announcing firms in the industry-wide sample; for example the negative abnormal returns for both types of firms are similar over the period (t-1, t=0). In addition, similarities can be seen in the negative abnormal returns experienced on the day of the profit warnings, for both types of firms the value was approximately (-19%), again, showing that information transfers are directional. This is evidence of a significant intra-industry information transfer and supports the theory that profit warnings convey industry-wide information in South Africa.

4.3 Cross-Sectional Regression Analysis

In this study, six explanatory variables are employed to describe the market reaction in non-announcing firms to profit warning announcements. The dependant variable used in the regression was the average cumulative abnormal returns (ACAR) of the non-announcing firms over the two day period (t=0, t+1). Some poignant alterations were made to the data-set before the regressions were performed. Firstly, with respect to the explanatory variable GROWTH, firms exhibiting negative price-earnings ratios (PER) were dropped from the data set[29]. Secondly, the robust standard errors were utilized in the process of running the regressions so as to

[29] A negative PER implies that investors will be given money in exchange for procuring a firms earnings. This is not a realistic scenario.

control for heteroscedasticity, which could result in inefficient estimators[30] (Gujarati pg:394, 2003). The regression results for the firm specific sample are analysed first, Table 6, followed by the results for the industry-wide sample, Table 7.

Table 6: Multivariate Cross-Sectional Regression - Firm Specific Sample

Linear regression					Number of Observations	38
					F(6, 31)	10.5
					Prob > F	0
					R-squared	0.233
					Root MSE	0.304
CAR	**Coefficient**	**Robust Standard Error**	**t-statistic**	**P-value**	**[95% Confidence Interval]**	
CARA	-0.059	0.085	-0.690 **	0.045	-0.232	0.114
LNMVE	0.024	0.029	0.840	0.406	-0.035	0.084
HOMOG	-0.242	0.093	-2.610 **	0.014	-0.431	-0.053
GROWTH	-0.143	0.701	-0.200	0.84	-1.571	1.286
SENT	0.014	0.021	-0.480	0.637	0.000	0.000
COMPET	0.097	0.114	-0.840	0.405	0.000	0.000
constant	-0.031	0.265	0.120	0.907	-0.509	0.571

Note: The t-statistics are calculated using White-corrected standard errors. *** Indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

The firm specific sample contained 38 profit warnings. The F-statistic of the model (10.5) and its accompanying P-value prove the model to be highly significant, despite the seemingly low R-squared value[31] of (23.3%). Therefore we can conclude that the model possesses significant explanatory power.

CARA: the cumulative abnormal returns of the announcing firms are significant at the 5% significance level, given a P-value of (0.045). The coefficient of (-0.059) indicates that the non-announcing firms' cumulative abnormal returns increase as a result of a profit warning announcement conveying firm specific information. This provides evidence of a competitive effect, in which rival firms' react favourably to a pessimistic announcement from a firm in the same industry. This is in accordance with Clinch & Sinclair (1987) and Helbok & Walker (2003) who found that information transfers were directional.

[30] Heteroscedasticity is typically present in cross-sectional data-sets.
[31] R-squared (Coefficient of Determination) is a summary measure that tells how well the sample regression line fits the data (Gujarati, pg: 81, 2003).

LNMVE: the size of the announcing firm is insignificant in explaining the variation in the cumulative abnormal returns of the non-announcing firms.

HOMOG: the homogeneity of an industry is significant at the 5% level. The P-value of (0.014) suggests that this variable is highly significant in explaining the abnormal returns of the non-announcing firms in the firm specific sample. If a profit warning is reported by a firm in a homogenous industry, the abnormal returns of the competing firms in the same industry decrease by 0.242%. This provides evidence that the higher the degree of industry homogeneity, the more negative the cumulative abnormal returns of non-announcing firms. These results counter our expectation of a positive relationship between the cumulative abnormal return of the non-announcing firms and the degree of industry homogeneity. The movement in the presence of homogeneity is small, possibly due to the limited degree of intra-industry information transference.

GROWTH: the growth of the announcing firm is insignificant in explaining the share price movements of the non-announcing firms.

SENT: market sentiment appears to be highly insignificant and does not contribute to the explanatory power of the model.

COMPET: competition, measured by the Herfindahl Index, is insignificant in the model of firm specific profit warnings.

Table 7: Multivariate Cross-Sectional Regression – Industry-Wide Sample

Linear regression					Number of observations	13
					F(6, 6)	18.24
					Prob > F	0.0013
					R-squared	0.576
					Root MSE	0.252
CAR	**Coefficient**	**Robust Standard Error**	**t-statistic**	**P-value**	**[95% Confidence**	**Interval]**
CARA	0.445	0.222	2.010 *	0.092	-0.098	0.989
LNMVE	0.003	0.035	0.080	0.937	-0.083	0.089
HOMOG	0.444	0.424	1.050 **	0.035	-0.594	1.482
GROWTH	-0.205	0.921	-0.220	0.832	-2.458	2.049
SENT	0.072	0.093	0.920 *	0.092	0.000	0.001
COMPET	0.004	0.015	0.320	0.762	0.000	0.000
constant	-0.007	0.288	0.020	0.981	-0.697	0.711

Note: The t-statistics are calculated using White-corrected standard errors. *** Indicates statistical significance at the 1% level, ** at the 5% level, and * at the 10% level.

The industry-wide sample contained 13 profit warnings. The F-statistic of the model (18.24) and its accompanying P-value prove the model to be highly significant. The

R-squared value of (57.6%) is relatively high, indicating that the model explains over half of the variation in the cumulative abnormal returns of the non-announcing firms.

CARA: the cumulative abnormal returns of the announcing firms are significant at the 10% significance level, with a P-value of (0.092). The coefficient is positive and less than one, indicating that the non-announcing firms' cumulative abnormal returns decrease as a result of a profit warning announcement conveying industry-wide information, however to a lesser extent than the negative reaction in the announcing firms. This suggests a greater degree of intra-industry information transfers, in the case of profit warnings conveying industry-wide information, which was expected. This apparent contagion effect is in accordance with Jin (2004), Szewczyk (1992) and Tawatnuntachai & D'Mello (2002).

LNMVE: again, the size of the announcing firm is insignificant in explaining the variation in the cumulative abnormal returns of the non-announcing firms.

HOMOG: the homogeneity of an industry is again significant at the 5% level. The P-value of (0.035) suggests that this variable is highly significant in explaining the abnormal returns of the non-announcing firms in the industry-wide sample. If a profit warning is reported by a firm in a homogenous industry, the abnormal returns of the competing firms in the same industry increase by 0.444%. This provides evidence that the higher the degree of industry homogeneity, the less negative the cumulative abnormal returns of non-announcing firms. These results concur with our expectation of a positive relationship between the cumulative abnormal return of the non-announcing firms and the degree of industry homogeneity (Kohers, 1999). Thus, competing firms in homogeneous industries react less negatively to profit warnings that are issued for industry-wide reasons than do firms in less homogeneous industries. This is as a result of a more profound competitive effect in homogenous industries.

GROWTH: again, the growth of the announcing firm is insignificant in explaining the share price movements of the non-announcing firms.

SENT: market sentiment appears to be significant at the 10% level and therefore contributes to the explanatory power of the model. The P-value of (0.092) suggests that the 'mood' in the market over the 20 days prior to the profit warnings affects the cumulative abnormal returns of the non-announcing firms. This appears to provide evidence that the negative share price reaction in non-announcing firms, following the

announcement of a profit warning that conveys industry-wide information, is attenuated when the recent market sentiment has been positive.

COMPET: again, the measurement of competition provided by the Herfindahl Index is insignificant in the model of industry-wide profit warnings.

V Summary and Conclusions

This paper has applied statistical techniques to the abnormal returns of announcing and non-announcing firms as well as to a number of accounting ratios, to determine whether or not profit warnings convey industry-wide information in South Africa.

The results for the AAR and ACAR for the firm specific sample highlighted the following points: For the announcing firms, the pattern of abnormal returns followed appeared to be frenzied. Jackson & Madura's (2003) research of profit warnings claimed that the signal conveyed in a profit warning is uncertain because the market may have anticipated the information from other news disseminated about a firm, an industry, or the general economy. The positive abnormal returns experienced on the day of the profit warning announcement, and the delayed negative abnormal returns seen from t+2 onwards, seem to typify this element of uncertainty. A possible explanation for this, in this study, was that the market may have been waiting to see the widespread effects of the profit warning on the entire industry before acting. Nevertheless, the movements of the share prices seem to reflect an eventual large drop in abnormal returns for the announcing firms, perhaps as a result of the initial under-reaction to the profit warning. This is in accordance with research conducted by Collett (2004).

As was expected, and in accordance with Foster (1981), the AAR for the non-announcing firms were less pronounced than the announcing firms in the firm specific sample. The degree of intra-industry information transference was evidently small. However, there was no evidence of a competitive effect, but instead evidence of a marginal contagion effect, as the AAR of non-announcing firms over the period acutely around t=0 were negative.

The industry-wide sample proved to demonstrate the expected outcome. Profit warnings conveying industry-wide information were anticipated earlier by the market and therefore negative AAR were seen as early as t-4. The finding of significant negative abnormal returns in the days leading up to the announcement day provides evidence of some information leakage. This is consistent with the results of Jackson and Madura (2003). In addition to information leakage, a profit warning conveying

industry-wide information is more easily anticipated by the market, and therefore the AAR of the non-announcing firms were also seen to exhibit negative trends prior to the announcement. The similarity between the patterns of announcing and non-announcing firms' AAR within this sample provides evidence of a significant intra-industry information transfer in South Africa. A recovery, post announcement, in terms of AAR, was noticed for both the announcing and non-announcing firms suggesting an overreaction by the market to the profit warning.

The analysis of the AAR and ACAR for the full sample was an amalgamation of the results for the firm specific sample and industry-wide sample. As a result, the full sample follows a combination of the two AAR patterns. The initial negative AAR was observed from t-4 up until t=0 for the announcing firms, which is in accordance with the expected outcome as a combination of information leakage and commonly known industry-wide information result in an early anticipation of the profit warning. After t=0, we see the dominant effect of the firm-specific sample for the announcing firms as AAR remain predominantly negative up until t+4, at which point we eventually see positive AAR. The large negative abnormal returns post announcement may have been the result of the general negative sentiment apparent in the market prior to the announcements.

The AAR for non-announcing firms in the full sample of profit warnings appears to make little sense. The abnormal returns of the non-announcing firms were significantly less pronounced than those of the announcing firms. The results did show negative abnormal returns over the period (t-1, t=0), which were expected. However, it is difficult to discern any meaningful conclusions based on the erratic nature of the AAR of the non-announcing firms in the full sample. A possible explanation for the apparent randomness of the AAR in the full sample is that the firm specific sample (n=38) was nearly three times the size of the industry-wide sample (n=13). This would lead to the dominance of the pattern visible in the AAR of the firm specific sample. This adds further impetus to the notion proposed by Foster (1981) and Jin (2004), asserting that some profit warnings convey firm specific information and others industry-wide information, thus implying that the two different types of profit warnings should be studied separately in order to obtain meaningful results.

The cross-sectional regression analysis produced interesting results for both the firm specific sample and the industry-wide sample. For the firm specific sample of profit warnings, the size of the announcing firms (LNMVE) was not a significant contributor to the cumulative abnormal return of the non-announcing firms; this counters findings by Defeo (1986). The same was the case for the GROWTH and SENT variable. With regards to the insignificance of the SENT variable, this could be due to the nature of firm specific information, that is, the bad news contained in profit warnings are specific to the announcing firm alone even given all recent conditions of market sentiment. This study was the first to include an explanatory variable detailing the level of competition (COMPET) in each industry in South Africa. The results confirm that the competitive nature of an industry has no significant effect on the reaction of competing firms in an industry to a profit warning; this in contradiction to the findings of Foster (1981) and Kohers (1999). The Cumulative abnormal returns of the announcing firms (CARA) were found to influence the abnormal returns of the non-announcing firms. Thus, if the profit warning conveys firm specific information, the results provide evidence of a competitive effect, in which rival firms react favourably to a pessimistic announcement from a firm in the same industry. This outcome was as expected. In a homogenous industry, the negative reaction of non-announcing firms is more severe in the firm-specific sample. The marginal effect on the announcing firms' abnormal returns in a homogenous environment was found to be small, but negative. In a homogenous industry, the products and services offered by firms are similar. This suggests that the market perceives a pessimistic announcement by one firm as an indication of the potentially poor performance of competing firms in the same industry (contagion effect). This countered the argument by Collett (2004) and instead seems to suggest that non-announcing firms in industries characterised by homogeneity, experience a more severe negative reaction to abnormal returns.

The cross-sectional regression model on the industry-wide sample of profit warnings was found to be significant. Again, the size of the announcing firms (LNMVE), GROWTH and the competition variable COMPET were found to be poor explanatory variables. The average cumulative abnormal returns of the announcing firms explained some of the movements in the abnormal returns of the non-announcing

firms. Thus, if the profit warning contains new industry related information, the announcement will result in the market inflicting more damage on the industry. This is what was expected, as the profit warnings in this sample, conveyed information about the entire industry and not just the announcing firm. Again, the homogeneity of the industry affects the AAR of the non-announcing firms. However, in this sample the direction of the movements in abnormal returns were found to be positive in a homogenous environment. Thus the negative AAR of non-announcing firms is attenuated in homogenous industries. This provides evidence that homogeneous industries provide an environment conducive to competitive reactions. That is, rival firms in homogeneous industries react less negatively to profit warnings that are issued for industry-wide reasons than do firms in less homogeneous industries. The positive coefficient of the market sentiment variable (SENT) for this sample of profit warnings provides evidence that the negative AAR reaction in non-announcing firms is attenuated when the recent market sentiment has been positive. That is, the market punishes competing firms to a lesser extent when market sentiment is relatively favourable.

In conclusion, the results seem to support the hypothesis that profit warnings convey industry-wide information in South Africa. In particular, the sample of industry-wide profit warnings were shown to affect the share prices of all competing firms in a given industry. The firm-specific sample seemed to be characterised by a market hesitant to react hastily to profit warnings conveying exclusively firm relevant information, with limited intra-industry information transference. Further investigations would greatly assist these results, as up to this date, limited research has been conducted on this subject in South Africa. Extending the period of profit warnings under observation, as well as increasing the number of industry-wide profit warning cases, would provide a more lucid view on the subject. The model, breaking down the potential causes of reactions in the abnormal returns of the non-announcing firms, could also be extended to increase explanatory power. The addition of more relevant explanatory variables would serve to assist analysts and shareholders in better understanding the information communicated by profit warnings in South Africa.

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Appendix A: Profit Warning Classification

A.1. Characteristics of Industry-Wide and Firm Specific Profit Warnings

Table A1. provides the basis on which profit warnings were classified into the industry-wide and firm specific groups as suggested by Yiannakis (2006). The classification is based on the content of the profit warning announcement released to the market.

Table A. 1 Classification of Profit Warnings into Industry-Wide and Firm Specific Groups

Firm Specific	Industry-Wide
Production & Quality problems	Difficult Market/Trading Conditions
Accounting Errors/Difficulties	Regulation/Legislation
Litigation costs	Adverse weather conditions
Delays to contracts and negotiations	Sales short of forecasts
	Detrimental national or global
Loss of major customer	economic occurrences
Restructuring costs	
Acquisition/mergers costs	
Problems with contracts and negotiations	
Management and systems problems	
Fraud/Theft	
Repair/remedial works	
HR difficulties – hiring/retrenching staff	

A.2. Examples of Profit Warnings and their Classification

➔ Profit Warning announcement by Growthpoint Properties Limited (GRT) (10 February 2000)

Shareholders are advised that negotiations are in progress with regard to the disposal of dexterous developments, a company acquired during 1999, which if

successfully concluded may have a material effect on the price of the company's shares. Shareholders are therefore advised to exercise caution in their dealings in synergy shares on the Johannesburg stock exchange until a full announcement is made. Shareholders are further warned that the disposal of dexterous combined with a slow-down in business over December and January, primarily related to 'y2k' activity, has obliged the company to revise its forecast headline earnings per share for the year to 29 February 2000 from 5.38 cents down to 4.0 cents.

The above announcement was determined to represent 'restructuring costs' associated with the firm. These costs will affect the share price of Growthpoint Properties Limited.

Classification: Firm Specific

➔ Profit Warning announcement by Kairos Holdings Limited (KIR) (25 February 2000)

Acuity shareholders are advised that the earnings for the group for the six months ended 31 December 1999, have been affected by certain subsidiaries acquired at listing not performing as per their forecasts. These subsidiaries have been disposed of prior to year-end and certain unforeseen costs have been incurred as a result of their disposal/closing down. As such acuity will not achieve the earnings growth forecasted in its prospectus dated 17 may 1999. Despite the above, it is expected that the acuity group will still achieve positive earnings growth for the six months to December 1999 in excess of the corresponding period in the previous financial year. Acuity has been re-organised into four business units. All of these business units contributed positively to earnings growth for the period to 31 December 1999. Acuity will release its audited financial results in the first week of March 2000.

The above announcement was determined to represent 'sales short of forecasts' as the subsidiaries are not performing as per their forecasts. These costs will affect the share price of Kairos Industrial Holdings Limited and competing firms in the Engineering-general industry.

Classification: Industry-Wide

Appendix B: Division of Sectors and Sub-Sectors into All Share Economic Group Indices

Table B. 2 FTSE Global Classification System (The FTSE/JSE Africa Index Series: A Comprehensive Guide, 2006).

Economic Group	Sector and Sub-Sector			
Resources (00) (J000)	Mining (04) (J004) ❑ Coal (042) (J151) ❑ Gold Mining (043) (J150) ❑ Platinum (044) (J153) ❑ Mining Finance (045) (J155) ❑ Diamond (046) (J152) ❑ Other Mineral Extractors and Mines (048) (J154)		Oil & Gas (07) (J007) ❑ Oil Gas - Exploration & Production (073) ❑ Oil - Services (075) ❑ Oil - Integrated (078)	
Basic Industries (10) (J010)	Chemicals (11) (J011) ❑ Chemicals - Commodity (113) ❑ Chemicals - Advanced Materials (116) ❑ Chemicals - Speciality (118)	Construction & Building Materials (13) (J013) ❑ Builders Merchants (131) ❑ Building and Construction Materials (132) ❑ House Building (134) ❑ Other Construction (137)	Forestry & Paper (15) (J015) ❑ Forestry (153) ❑ Paper (156)	Steel & Other Metals (18) (J018) ❑ Non-Ferrous Metals (186) ❑ Steel (189)
General Industrials (20) (J020)	Aerospace & Defence (21) (J021) ❑ Aerospace (216) ❑ Defence (216)	Diversified Industrials (24) (J024) ❑ Diversified Industrials (240)	Electronic & Electrical Equipment (25) (J025) ❑ Electrical Equipment (252) ❑ Electronic Equipment (253)	Engineering & Machinery (26) (J026) ❑ Commercial Vehicles & Trucks (263) ❑ Engineering - Contractors (264) ❑ Engineering Fabricators (266) ❑ Engineering - General (267)
Cyclical Consumer Goods (30) (J030)	Automobiles & Parts (31) (J031) ❑ Automobile (311) ❑ Auto Parts (313) ❑ Tyres & Rubber (317) ❑ Vehicle Distribution (318)		Household Goods & Textiles (34) (J034) ❑ Clothing & Footwear (341) ❑ Furnishings & Floor Coverings (342) ❑ Household Appliances & Housewares (345) ❑ Leisure Equipment (347) ❑ Other Textiles & Leather Goods (349)	
Non Cyclical Consumer Goods (40) (J040)	Beverages (41) (J041) ❑ Beverages - Brewers (415) ❑ Beverages - Distillers & Vintners (416) ❑ Soft Drinks (418)	Food Producers & Processors (43) (J043) ❑ Farming & Fishing (433) ❑ Food Processors (435)	Personal Care & Household Products (47) (J047) ❑ Household Products (475) ❑ Personal Products (477)	Pharmaceuticals & Biotechnology (48) (J048) ❑ Pharmaceuticals (480) ❑ Biotechnology (482)
		Health (44) (J044) ❑ Health Maintenance Organisations (443) ❑ Hospital Management & Long Term Care (444) ❑ Medical Equipment & Supplies (446) ❑ Other Health Care (449)		Tobacco (49) (J049) ❑ Tobacco (490)
Cyclical Services (50) (J050)	General Retailers (52) (J052) ❑ Discount & Super Stores & Warehouses (524) ❑ Retailers eCommerce (525) ❑ Retailers - Hardlines (526) ❑ Retailers - Multi Department (527) ❑ Retailers - Soft Goods (528)	Leisure, Entertainment & Hotels (53) (J053) ❑ Gaming (532) ❑ Home Entertainment (535) ❑ Hotels (536) ❑ Leisure Facilities (538) ❑ Restaurants & Pubs (539)	Support Services (58) (J058) ❑ Business Support Services (581) ❑ Education, Business Training & Employment Agencies (583) ❑ Environmental Control (584) ❑ Funerals & Cemeteries (585) ❑ Laundries & Cleaners (586) ❑ Security & Alarm Services (589)	Transport (59) (J059) ❑ Airlines & Airports (591) ❑ Rail, Road & Freight (596) ❑ Shipping & Ports (597)
		Media & Photography (54) (J054) ❑ Broadcasting Contractors (542) ❑ Cable & Satellite (543) ❑ Media Agencies (545) ❑ Photography (546) ❑ Publishing & Printing (547)		
Non Cyclical Services (60) (J060)	Food & Drug Retailers (63) (J063) ❑ Food & Drug Retailers (630)		Telecommunication Services (67) (J067) ❑ Fixed-Line Telecommunication Services (673) ❑ Wireless Telecommunication Services (678)	
Utilities (70) (J070)	Electricity (72) (J072) ❑ Electricity (720)	Gas Distribution (73) (J073) ❑ Gas Distribution (730)	Water (78) (J078) ❑ Water (780)	
Financials (80) (J080)	Banks (81) (J081) ❑ Banks (810)	Life Assurance (84) (J084) ❑ Life Assurance (840)	Real Estate (86) (J086) ❑ Real Estate Holding & Development (862) ❑ Property Agencies (864)	Investment Entities (Ineligible) (89) (n/a) ❑ Investment Entities ineligible for Inclusion in FTSE (890)
	Insurance (83) (J083) ❑ Insurance Brokers (833) ❑ Insurance Non-life (834) ❑ Re-Insurance (837) ❑ Other Insurance (839)	Investment Companies (85) (J085) ❑ Investment Companies (850)	Speciality & Other Finance (87) (J087) ❑ Asset Managers (871) ❑ Consumer Finance (873) ❑ Investment Banks (875) ❑ Mortgage Finance (877) ❑ Other Financial (879)	
Information Technology (90) (J090)	Information Technology Hardware (93) (J093) ❑ Computer Hardware (932) ❑ Semiconductors (936) ❑ Telecommunications Equipment (938)		Software & Computer Services (97) (J097) ❑ Computer Services (972) ❑ Internet (974) ❑ Software (977)	
	Kruger Rands (A1) (n/a)	Preference Shares (A3) (n/a)	Warrants (A5) (n/a)	Exchange Traded Funds (A7)

Appendix C: The Herfindahl Index

C.1. Explanation of the Method of Measurement and Use of the Herfindahl Index

The **Herfindahl index**, also known as **Herfindahl-Hirschman Index** or **HHI**, is a measure of the size of firms in relationship to the industry and an indicator of the amount of competition among them. It is defined as the sum of the squares of the market shares of each individual firm. It can range from 0 to 10,000 moving from a very large amount of very small firms (highly competitive industry) to a single monopolistic producer. Increases in the Herfindahl index generally indicate a decrease in competition and an increase of market power, whereas decreases indicate the opposite. The major benefit of the Herfindahl index is that it gives more weight to larger firms ("Herfindahl Index", retrieved on November 7, 2008, from Wikipedia: http://www.wikipedia.com).

C.2. Examples of Herfindahl Index Calculations

Example

For instance, two cases in which the six largest firms produce 90 % of the output:

- Case 1: All six firms produce 15% each, and
- Case 2: One firm produces 80 % while the five others produce 2 % each.

We will assume that the remaining 10% of output is divided among 10 equally sized producers. The six-firm concentration ratio would equal 90 % for both case 1 and case 2, but in the first case competition would be fierce where the second case approaches monopoly. The Herfindahl index for these two situations makes the lack of competition in the second case strikingly clear:

- Case 1: Herfindahl index = $6 * 15^2 + 10 * 1^2 = 1360$
- Case 2: Herfindahl index = $80^2 + 5 * 2^2 + 10 * 1^2 = 6430$

This behaviour rests in the fact that the market shares are squared prior to being summed, giving additional weight to firms with larger size.

Appendix D: Frequency Distribution of Industries for Announcing and Non-Announcing Firms.

D.1. Filters Applied to the Data-Set

A (*) is indicative of a scenario in which an industry experienced more than one profit warning. As explained in Section II, these scenarios resulted in the second profit warning and the announcing firm being excluded from the data-set. In all of the below industries, the number of non-announcing firms was at least 2 and no more than 10.

Table D. 3 Frequency Distribution of industries for announcing and non-announcing firms

Industry	No. of Announcing Firms	Percentage of Total Announcing Firms	Average No. of Rival Firms per Announcement	Total No. of Rival Firms	Percentage of Tot Rival Firms
Auto Parts	2	3.64%	2	3	1.30%
Banks	1	1.82%	8	8	3.46%
Building & Construction Materials	1	1.82%	10	10	4.33%
Business Support Services	3	5.45%	3	10	4.33%
Chemicals – Speciality	1	1.82%	5	5	2.16%
Computer Services	4	7.27%	4	15	6.49%
Containers & Packaging	1*	5.45%	4	4	1.73%
Diamond	1	1.82%	10	10	4.33%
Diversified Industrials	2	9.09%	3	6	2.60%
Electrical Equipment	1*	1.82%	8	8	3.46%
Electronic Equipment	2	3.64%	3	5	2.16%
Engineering – General	3	5.45%	2	5	2.16%
Farming & Fishing	1	1.82%	10	10	4.33%
Food & Drug Retailers	1	1.82%	4	4	1.73%
Gold Mining	2	3.64%	9	17	7.36%
Insurance - Non-Life	2	3.64%	2	3	1.30%
Investment Banks	4	7.27%	3	12	5.19%
Investment Companies	1	1.82%	10	10	4.33%
Metals & Minerals	2	3.64%	9	18	7.79%
Other Construction	1	1.82%	10	10	4.33%
Other Financial	4	7.27%	2	7	3.03%
Publishing & Printing	1	1.82%	5	5	2.16%
Real Estate Holdings & Development	2	3.64%	10	20	8.66%
Restaurants and Pubs	2	3.64%	2	3	1.30%
Retailers – Hardlines	1	1.82%	4	4	1.73%
Retailers - Multi Department	2	3.64%	3	6	2.60%
Retailers - Soft Goods	1	1.82%	8	8	3.46%
Shipping & Ports	1	1.82%	5	5	2.16%
Total: 28 defined industries	51	100%	4.53	231	100%

Declaration

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.
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